

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-15 (cancelled):

Claim 16 (currently amended): A process for production of an artificial tooth substitute to be fitted on a prepared dental stump comprising the steps of:

- (1) selecting a blank of porous ceramic material ~~having;~~
- (2) ~~determining~~ a relative density  $\rho_R$  and an achievable relative density  $\rho_S$  after sintering for the blank of porous ceramic material selected in step (1);
- (3) scanning and digitizing a three-dimensional outer and inner surface of a positive model of a skeletal structure for the artificial tooth substitute to obtain data;
- ~~determining~~ (4) ~~calculating~~ an enlargement factor (f) for the obtained data in accordance with the following

$$f = \sqrt[3]{\frac{\rho_S}{\rho_R}}$$

where  $\rho_R$  is the relative density ~~of the blank~~ and  $\rho_S$  is the achievable relative density after sintering determined in step (2);

- (5) enlarging the obtained data linearly in all directions by the enlargement factor (f) calculated in step (4) thereby compensating precisely for sinter shrinkage to obtain modified data for an enlarged model;
- (6) transferring the modified data to a control unit of a

processing machine;

(7) processing the blank of porous ceramic material selected in step (1) in the processing machine and removing material therefrom to produce a design form of the enlarged model;

(8) sintering the design form of porous ceramic material to obtain a skeletal structure having precise end dimensions; and

(9) facing the skeletal structure as desired to form the artificial tooth substitute.

Claim 17 (currently amended): A process according to claim 16 ~~or~~ ~~33~~, wherein the artificial tooth substitute is formed with fine run-out margins.

Claim 18 (currently amended): A process according to claim 16 ~~or~~ ~~33~~, wherein the sintering of the enlarged model comprises sintering to a density within the range of 90 to 100% of the achievable relative density.

Claim 19 (currently amended): A process according to claim 16 ~~or~~ ~~33~~, wherein the sintering of the enlarged model comprises sintering to a density within the range of 96 to 100% of the achievable relative density.

Claim 20 (currently amended): A process according to claim 16 ~~or~~ ~~33~~, wherein the sintering of the enlarged model comprises sintering to a density within the range of greater than 99% of the achievable relative density.

Claim 21 (currently amended): A process according to claim 16 ~~or~~ ~~33~~, wherein the blank is a presintered blank of pressed fine

ceramic powder.

Claim 22 (currently amended): A process according to claim 16 ~~or~~  
~~33~~, wherein the processing includes processing the blank in a  
first rough machining and then a second final machining.

Claim 23 (currently amended): A process according to claim 16 ~~or~~  
~~33~~, wherein, prior to the processing, the blank is heat treated  
at temperatures in the range from 50 to 200°C for a duration of  
2 to 20 hours.

Claim 24 (currently amended): A process according to claim 16 ~~or~~  
~~33~~, wherein, prior to the processing, the blank is heat treated  
at temperatures in the range from 90 to 150°C for a duration of  
2 to 6 hours.

Claim 25 (previously presented): A process according to claim  
23, wherein the processing of the blank into the enlarged model  
follows the heat treatment.

Claim 26 (previously presented): A process according to claim  
24, wherein the processing of the blank into the enlarged model  
follows the heat treatment.

Claim 27 (previously presented): A process according to claim  
21, including a step of presintering the blank for 0.5 to 6  
hours at a temperature of at least 450°C.

Claim 28 (currently amended): A process according to claim 16 ~~or~~  
~~33~~, wherein the ceramic material is selected from the group  
consisting of Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, MgO, Y<sub>2</sub>O<sub>3</sub>, zircon oxide mixed crystal

$Zr_{1-x}Me_xO_{2-(\frac{4n}{2})x}$ , and mixture thereof, where Me is a metal

which is present in the oxide form as a bi-, tri-, or tetravalent cation ( $n = 2, 3, 4$  and  $0 \leq x \leq 1$ ) and stabilises the tetragonal and/or cubic phase of the zircon oxide.

Claim 29 (previously presented): A process according to claim 28, wherein the ceramic material is mixed with an organic binding agent selected from the group consisting of polyvinyl alcohols (PVA), polyacrylic acids (PAA), celluloses, polyethyleneglucols, and mixtures thereof.

Claim 30 (previously presented): A process according to claim 29, wherein the proportion of binding agent lies in the range from 0.1 to 45 vol%.

Claim 31 (previously presented): A process according to claim 29, wherein the proportion of binding agent lies in the range from 0.1 to 5 vol%.

Claim 32 (previously presented): A process for production of an artificial tooth substitute to be fitted on a prepared dental stump comprising the steps of:

scanning and digitizing a three-dimensional outer and inner surface of a positive model of a skeletal structure for the artificial tooth substitute to obtain data;

determining an enlargement factor (f) for the obtained data in accordance with the following

$$f = \sqrt[3]{\frac{\rho_s}{\rho_R}}$$

where  $\rho_R$  is the relative density of a blank and  $\rho_s$  is the achievable relative density after sintering;

enlarging the obtained data linearly in all directions by the enlargement factor (f) thereby compensating precisely for sinter shrinkage to obtain modified data for an enlarged model;

transferring the modified data to a control unit of a processing machine for generating a desired path of a tool;

ceasing scanning and digitizing;

processing a blank of porous ceramic material in the processing machine wherein material is removed by the tool moving along the devised path to produce a design form of the enlarged model;

dense-sintering the design form of porous ceramic material to obtain a skeletal structure having precise end dimensions; and

facing the skeletal structure as desired to form the artificial tooth substitute.

Claim 33 (currently amended): A process for production of an artificial tooth substitute to be fitted on a prepared dental stump comprising the steps of:

~~(a)~~ (1) selecting a ~~preprepared~~ blank of porous ceramic material having a relative density  $\rho_R$ ;

~~(b)~~ (2) sintering a further piece of the porous ceramic material under a set of sintering conditions to obtain an achievable relative density  $\rho_S$  of the ceramic material after sintering;

~~(c)~~ (3) scanning and digitizing a three-dimensional outer and inner surface of a positive model of a skeletal structure for the artificial tooth substitute to obtain data;

~~(d)~~ (4) determining an enlargement factor (f) for the obtained data in accordance with the following

$$f = \sqrt[3]{\frac{\rho_s}{\rho_R}}$$

where  $\rho_R$  is the relative density of the preprepared blank and  $\rho_s$  is the achievable relative density of the porous ceramic material after sintering obtained in step ~~(b)~~ (2);

~~(e)~~ (5) enlarging the obtained data linearly in all directions by the enlargement factor (f) thereby compensating precisely for sinter shrinkage to obtain modified data for an enlarged model;

~~(f)~~ (6) transferring the modified data to a control unit of a processing machine;

~~(g)~~ (7) processing the blank of porous ceramic material in the processing machine and removing material therefrom to produce a design form of the enlarged model;

~~(h)~~ (8) sintering under the set of sintering conditions of step (b) the design form of porous ceramic material to obtain a skeletal structure having precise end dimensions; and

~~(i)~~ (9) facing the skeletal structure as desired to form the artificial tooth substitute.

Claim 34 (previously presented): A process according to claim 28, wherein the ceramic material is mixed with an organic binding agent comprising thermoplastics.

Claim 35-40 (cancelled):

Claim 41 (new): A process according to claim 16, wherein the enlargement factor is calculated to .000x, where x is an integer.

Claim 42 (new): A process according to claim 32, wherein the

enlargement factor is calculated to  $.000x$ , where  $x$  is an integer.

Claim 43 (new): A process according to claim 33, wherein the enlargement factor is calculated to  $.000x$ , where  $x$  is an integer.